

MASTER OF SCIENCE IN AERONAUTICAL ENGINEERING

EVALUATION OF THE USE OF GPS-AIDED WEAPONS TO ATTACK MOVING TARGETS

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The current intelligence gathering and strike decision infrastructure is optimized to handle geographically and temporally fixed targets. When tasked to respond to targets that require near immediate engagement, however, the system is stressed to the limit of its capability. When these time sensitive targets are capable of relocating, the process of rapidly applying lethal force becomes even more complicated. This thesis examines the problems associated with attacking a moving target using low cost GPS-aided standoff weapons, without an integrated weapon seeker. It begins with a discussion of the history and evolution of the Navy's ability to attack time sensitive moving targets, and provides the description of a system that could address shortcomings noted. MATLAB[®] Simulink[®] was used to develop a model to simulate the proposed system, and determine the responses to various combinations of identified error sources. The results of the research showed that the type of system proposed is technically feasible.

DoD KEY TECHNOLOGY AREAS: Air Vehicles, Command, Control, and Communications, Conventional Weapons, Sensors, Modeling and Simulation, Other (Time Critical Strike)

KEYWORDS: GPS, Weapon, Modeling, CEP, Time Sensitive Targets, Command Control and Communications, Conventional Weapons, Sensors, Modeling and Simulation, Time Critical Strike, Stand-off Weapons

TARGETING AND FIRE CONTROL SYSTEM ANALYSIS OF THE NEW TURKISH ATTACK HELICOPTER "THE AH-1Z KINGCOBRA"

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In May of 1997, the Turkish Military issued a Request for Proposal for the purchase of 145 attack helicopters. Turkey has chosen Bell Helicopter's KingCobra as its attack helicopter. The major difference between the USMC version of AH-1Z and the Turkish version KingCobra is the Targeting and Fire Control System. Bell Helicopter Textron has chosen Lockheed Martin to develop and build a new targeting system, the Target Sight System (TSS). The TSS will contain Lockheed Martin's 3-5 μ m midwave staring array FLIR. On the other hand, the Turkish Secretariat for Defense Industries (SSM) has chosen Aselsan ASELFLIR-300T that contains an 8-12 μ m longwave scanning second-generation FLIR.

A comparison of range performance for these two systems has been made using the TAWS Field Performance Model. Since the physical parameters on these specific FLIRs are proprietary, the FLIR92 Simulation Model is used to generate performance parameters. These parameters are expected to represent

the general characteristics of the two systems. The resultant data is used in the TAWS Field Performance Model to predict the range performances.

The results have showed that the staring array midwave FLIR has longer ranges in the scenarios given in this thesis. This may not represent the real performance of the systems.

DoD KEY TECHNOLOGY AREAS: Air Vehicles, Sensors, Other (Thermal Imaging Systems)

KEYWORDS: Thermal Imaging Systems, Targeting, Fire Control Systems, Forward Looking Infrared, FLIR, TAWS, KingCobra, Attack Helicopter, Infrared